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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/713,514 | 11/14/2003 | Peter T. Anderson | 128410-2 (13865US02) | 9965 |

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EXAMINER

LE, JOHN H

ART UNIT PAPER NUMBER

2863

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/713,514

Applicant(s)

ANDERSON ET AL.

Examiner

John H. Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12, 20 and 22-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12, 20, 22-24 is/are allowed.
- 6) ☒ Claim(s) 25-27 and 29-31 is/are rejected.
- 7) ☒ Claim(s) 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

1. This office action is in response to applicant's amendment received on 12/27/2004.

Claims 23-31 have been added.

Claims 1-11, 13-19, and 21 have been cancelled.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 25-27, 29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider (US 2001/0045826) in view of Khalfin et al. (USP 6,369,564).

Regarding claim 25, Schneider discloses an electromagnetic tracking system (22) comprising a magnetic field generating unit (40)(Abstract, [0014], [0047]); a field sensing unit (26)([0014], [0048]-[0050]), the generating (40) and sensing (26) units being arranged to generate and to sense, respectively, an electromagnetic field in an arena of interest ([0050]); a distorter (30) having a known structure disposed at a selected location in the arena of interest ([0026]), and processor (24) modeling the distorter (30) ([0054]).

Regarding claims 26-27, and 31, Schneider discloses an electromagnetic tracking system (22) comprising a magnetic field generating unit (40) driven by a

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drive signal (Abstract, [0014], [0047]); a field sensing unit (26) having a sensing signal responsive to a changing magnetic field, said changing magnetic field including a position-dependent field produced by said magnetic field generating unit ([0014], [0048]-[0050]), the generating (40) and sensing (26) units being arranged to generate and to sense, respectively, an electromagnetic field in an arena of interest ([0050]); signal measurement and conditioning circuitry connected to said units to sample and digitize signal data (A/D and D/a converter) for the field generating and field sensing units ([0048]-[0050]); a distorter (30) having a known structure disposed at a selected location in the arena of interest ([0026]), and a processor (24) operative on the sampled and digitized signal data (A/D and D/a converter) to determine relative coordinates and orientations of said field generating or field sensing unit ([0048]-[0050]); said processor uses an integral method of correction to compensate for distortion caused by said distorter (e.g. [0054]).

Schneider fails to teach processor modeling the distorter as a ring model.

Khalfin et al. teach processor modeling the distorter as a ring model (Fig.2, Col.3, lines 17-21, Col.4, line 66-Col.5, line 26).

Regarding claim 29, Khalfin et al. teach at least one of said units (probe sensor) is movable (Fig.6, Col.6, lines 5-9, Col.7, line 14, lines 42-43).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to inform processor modeling the distorter as a ring model as taught by Khalfin et al. in an electromagnetic tracking system of Schneider for the purpose of providing a new technology and accompanying method for an

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electromagnetic position/orientation tracking in an environment wherein strong electromagnetic distortion may be present (Khalfin et al., Col.2, lines 58-61).

4. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider (US 2001/0045826) in view of Khalfin et al. (USP 6,369,564) as applied to claim 25 above, and further in view of Jacobs et al. (USP 6,636,757).

Regarding claim 30, the combination of Schneider and Khalfin et al. discussed supra, discloses the claimed invention except the distorter comprises a shielding device positioned in relation to a fluoroscopic detector.

Jacobs et al. disclose the distorter comprises a shielding device positioned in relation to a fluoroscopic detector (e.g. Col.2, lines 26-36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to inform the distorter comprises a shielding device positioned in relation to a fluoroscopic detector as taught by Jacobs et al. in an electromagnetic tracking system of Schneider in view of Khalfin et al. for the purpose of providing a method and apparatus for electromagnetic navigation of a surgical probe near a metal object (Jacobs et al., Col.2, lines 22-24).

Allowable Subject Matter

5. Claims 12, 20, 22-24 are allowed.

6. Claim 28 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 12 and 24, none of the prior art of record teaches or suggests the combination of an electromagnetic tracking system comprising a magnetic field generating unit driven by a drive signal, a field sensing unit having a sensing signal responsive to a changing magnetic field, said changing magnetic field including a position-dependent field produced by said magnetic field generating unit, the generating and sensing units being arranged to generate and to sense, respectively, an electromagnetic field in an arena of interest, and wherein at least one of said units is movable, signal measurement and conditioning circuitry connected to said units to sample and digitize signal data for the field generating and field sensing units, a distorter having a known structure disposed at a selected location in the arena of interest, and a processor operative on the sampled and digitized signal data to determine relative coordinates and orientations of said field generating or field sensing unit, said processor modeling the distorter and the generating and sensing units to generate modeled signal data and fitting said modeled signal data to measured signal values to determine coordinates and orientations of said field generating and field sensing units. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

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Regarding claim 24, none of the prior art of record teaches or suggests the combination of an electromagnetic tracking system comprising a magnetic field generating unit driven by a drive signal, a field sensing unit having a sensing signal responsive to a changing magnetic field, said changing magnetic field including a position-dependent field produced by said magnetic field generating unit, the generating and sensing units being arranged to generate and to sense, respectively, an electromagnetic field in an arena of interest, and wherein at least one of said units is movable, signal measurement and conditioning circuitry connected to said units to sample and digitize signal data for the field generating and field sensing units, a distorter having a known structure disposed at a selected location in the arena of interest, and a processor operative on the sampled and digitized signal data to determine relative coordinates and orientations of said field generating or field sensing unit, said processor modeling the distorter and the generating and sensing units to generate modeled signal data and fitting said modeled signal data to measured signal values to determine coordinates and orientations of said field generating and field sensing units, said processor models said distorter as a ring model. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Regarding claim 28, none of the prior art of record teaches or suggests the combination of an electromagnetic tracking system comprising a magnetic field generating unit, a field sensing unit, the generating and sensing units being

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arranged to generate and to sense, respectively, an electromagnetic field in an arena of interest, a distorter having a known structure disposed at a selected location in the arena of interest, and a processor modeling the distorter as ring model, wherein said processor models the generating and sensing units to generate modeled signal data and fitting said modeled signal data to measured signal values to determine coordinates and orientations of said field generating and field sensing units. It is these limitations as they are claimed in the combination with other limitations of claim, which have not been found, taught or suggested in the prior art of record, that make these claims allowable over the prior art.

Response to Arguments

7. Applicant's arguments filed 12/27/2004 have been fully considered but they are not persuasive.

-Applicant argues that the prior did not teach "processor modeling the distorter and the generating and sensing units to generate modeled signal data and fitting said modeled signal data to measured signal values to determine coordinates and orientations of said field generating and field sensing units" as cited in the independent claims 12 and 24.

Examiner agrees, therefore claims 12, 20, 22- 24 are allowed.

-Applicant argues that the prior did not teach, "at least one of said units is movable" as cited in claim 29.

Examiner position is that Khalfin et al. teach at least one of said units (probe sensor) is movable (Fig.6, Col.6, lines 5-9, Col.7, line 14, lines 42-43).

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-Applicant argues that the prior did not teach, "processor uses an integral method of correction to compensate for distortion caused by said distorter" as cited in new claim 31.

Examiner position is that Schneider teaches processor uses an integral method of correction to compensate for distortion caused by said distorter (e.g. [0054]).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Specifically Khalfin et al. has been added to second ground of rejection.

Contact Information

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John H Le whose telephone number is 571-272-2275. The examiner can normally be reached on 8:00--4:30.

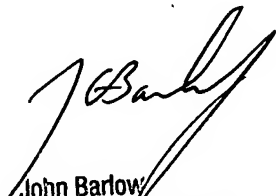
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Barlow can be reached on 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John H. Le

Patent Examiner-Group 2863

February 10, 2005


John Barlow
Supervisory Patent Examiner
Technology Center 2800